

WHAT IS CLAIMED IS:

1. An encoding apparatus, comprising:

a band gain encoding section for calculating an average amplitude of a frequency spectrum stream corresponding to each of a plurality of frequency bands so as to generate a first code representing the average amplitude of the frequency spectrum stream;

an encoding band determination section for determining at least one frequency band, for which the corresponding frequency spectrum stream is to be quantized and encoded from among the plurality of frequency bands;

a spectrum encoding section for quantizing and encoding the frequency spectrum stream of each of the at least one frequency band determined by the encoding band determination section so as to generate a second code; and

an encoded stream generation section for generating an encoded stream based on the first code and the second code.

2. An encoding apparatus according to claim 1, wherein the encoding band determination section determines whether or not the frequency spectrum stream corresponding to each of the plurality of frequency bands is to be quantized and encoded, based on the size of the first code representing the average amplitude of the frequency spectrum stream.

3. An encoding apparatus according to claim 1, wherein:

the encoding band determination section re-determines a frequency band, for which a corresponding frequency spectrum stream is to be quantized and encoded, among the frequency bands which were not determined to be

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quantized or encoded, the re-determination being performed based on the size of the second code generated by the spectrum encoding section for the at least one frequency band determined to be quantized and encoded, and

the spectrum encoding section quantizes and encodes the frequency spectrum stream for the re-determined frequency band so as to generate a second code.

4. An encoding apparatus according to claim 1, wherein the encoded stream generation section generates the encoded stream based on a third code representing the frequency band determined by the encoding band determination section, the first code, and the second code.

5. An encoding apparatus according to claim 1, wherein the spectrum encoding section performs Huffman encoding.

6. An encoding apparatus according to claim 1, wherein the spectrum encoding section performs vector quantization.

7. An encoding apparatus according to claim 1, wherein the spectrum encoding section performs Huffman encoding and vector quantization.

8. An encoding apparatus according to claim 1, further comprising a time region gain encoding section for calculating an average amplitude of a time signal stream, corresponding to each of a plurality of time regions, which is to be transformed into a frequency spectrum stream of each of the plurality of frequency bands, so as to generate a fourth code representing the average amplitude of the time signal stream.

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9. An encoding apparatus according to claim 1, further comprising a sub-band gain encoding section for generating a fifth code representing an average amplitude of each of a plurality of sub-bands, which are obtained by dividing at least one frequency band among frequency bands, for which a corresponding frequency spectrum stream is determined not to be quantized or encoded.

10. An encoding apparatus according to claim 9, wherein at least one of the plurality of sub-bands includes two or more frequency spectrum streams.

11. A decoding apparatus for decoding an encoded stream including a first code and at least one second code, the first code being generated so as to represent an average amplitude of a frequency spectrum stream of one of a plurality of frequency bands, and each of the at least one second code is generated by quantizing and encoding the frequency spectrum stream of the one of the frequency bands, the decoding apparatus comprising:

an encoded stream analysis section for analyzing the encoded stream so as to detect the first code and the at least one second code;

a band gain de-quantization section for de-quantizing the first code detected by the encoded stream analysis section into the average amplitude of the frequency spectrum stream;

an encoding band notification section for notifying whether or not the frequency band corresponding to the at least one second code includes a frequency band corresponding to the first code;

a spectrum de-quantization section for de-quantizing and decoding the second code into the frequency

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spectrum stream based on the notification by the encoding band notification section that the frequency band corresponding to the at least one second code includes a frequency band corresponding to the first code;

a noise spectrum stream generation section for generating a noise spectrum stream based on the notification by the encoding band notification section that the frequency band corresponding to the at least one second code does not include any frequency band corresponding to the first code; and

an amplification section for amplifying the frequency spectrum stream or the noise spectrum stream based on the average amplitude.

12. A decoding apparatus according to claim 11, wherein:
the encoded stream further includes a third code representing a frequency band, for which a corresponding frequency spectrum stream has been quantized and encoded, and

the encoding band notification section decodes the third code, and notifies whether or not the frequency band corresponding to the at least one second code includes a frequency band corresponding to the first code, based on the decoded third code.

13. A decoding apparatus according to claim 11, wherein the spectrum de-quantization section performs Huffman decoding.

14. A decoding apparatus according to claim 11, wherein the spectrum de-quantization section performs vector de-quantization.

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15. A decoding apparatus according to claim 11, wherein the spectrum de-quantization section performs Huffman decoding and vector de-quantization.

16. A decoding apparatus according to claim 11, wherein:

the encoded stream further includes a fourth code representing an average amplitude of a time signal stream of each of a plurality of time regions, which is to be transformed into a frequency spectrum stream of each of the plurality of frequency bands, and

the decoding apparatus further comprises a time gain region decoding section for decoding the fourth code into the average amplitude of the time signal stream.

17. A decoding apparatus according to claim 16, wherein:

the noise spectrum stream generation section generates a noise spectrum stream to be converted into a noise signal of each of the plurality of time regions, based on the fourth code decoded by the time gain region decoding section.

18. A decoding apparatus according to claim 11, wherein:

the encoded stream further includes a fifth code representing an average amplitude of each of a plurality of sub-bands which are obtained by dividing at least one frequency band among frequency bands, for which a corresponding frequency spectrum stream is not to be de-quantized, and

the decoding apparatus further comprises a sub-band gain decoding section for decoding the fifth code into the average amplitude of the sub-band and generates a noise spectrum stream for each of the plurality of sub-bands based on the decoded average amplitude.

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